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EXAMINER	
RILEY, MARCUS T	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,579	SAKAMOTO, YOICHI	
	Examiner	Art Unit	
	Marcus T. Riley	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/27/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *attached*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

2. **Claim 16** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 16 defines a computer readable storage medium embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and

functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed computer readable storage medium can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 8, 9, 13-15** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kawamoto '457 (US 6,151,457, hereinafter Kawamoto '457).

Regarding claim 8; Kawamoto '457 discloses an information processing apparatus, which is connectable to a printing apparatus in which sizes of reception buffer memory allocated for respective color components are changed in accordance with external instruction information,

and which outputs print data to said printing apparatus, comprising: generation means for generating image data for respective printing color components based on data to be print-outputted delivered from higher processing (*"Each image forming apparatus includes an image scanner that scans in an original document so as to generate image data,"* column 2, line 8-10); coding means for compress-encoding the image data for the respective printing color components generated by said generation means (*"an image processing unit for processing the image data, an encoding unit to encode the processed image data..."* column 2, line 11-12); notification means for generating memory allocation ratio information based on a ratio of coded data amounts for the respective printing color components coded by said coding means and notifying the information as said instruction information to said printing apparatus (*"the digital image after being filtered by the filter 50-3 is provided to a 4-line FIFO 54-1 of the memory unit 54. The 4-line FIFO stores the digital image data corresponding to 4 lines so as to form a 4.times.4 pixel matrix. Each 4.times.4 pixel matrix is sequentially provided to an encoding unit 54-2 so as to be encoded, and the encoded data is provided to a memory 54-4 such as a DRAM via a selector A 54-3 and is stored in the memory 54-4. The data stored in the memory 54-4 is provided to a hard disc unit 58 by a transfer control unit 57. The image data transferred to the hard disc unit 58 is stored on an individual original document basis. Accordingly, the image data stored in the hard disc unit 58 can be read out on an individual original document basis."* column 7, lines 21-34); and output means for outputting the image data for the respective printing color components coded by said coding means to said printing apparatus (*"The digital copy machine 110 can compress the digital image data, and the compressed image data can be transferred to other image forming apparatuses such as the digital copy machine 120 via an*

image transfer unit 70 while decoding the compressed digital image data so as to output an image based on the decoded digital image data." column 7, lines 16-21).

Regarding claim 9; Kawamoto '457 discloses where said generation means includes dither processing means for quantizing one-pixel eight-bit image data for one printing color component into smaller-number-of-bit image data (*"The image processing unit 50 performs various operations such as a black offset correction, a shading correction, an MTF correction, a .gamma.-correction and a dither process or an error diffusion process. The 8-bit digital image data SDT(7:0) processed by the image processing unit 50 is provided to a printer unit 52."* column 6 , lines 11-16).

Regarding claim 13; Kawamoto '457 discloses request means for requesting status information of said reception buffer from said printing apparatus; determination means for determining whether or not next page compressed data for the respective printing color components can be stored in available areas of the reception buffer for the respective printing color components, based on the status information obtained by said request means; and control means for, if said determination means determines that the next page compressed data can be stored, deleting the memory allocation ratio information to be notified by said notification means and causing said output means to output the next page compressed data (*"Additionally, in the present embodiment, a command transfer unit 70-5 comprising a transmission buffer and a reception buffer is provided in the image transfer unit 70. The transmission buffer transmits a signal TXD to the receiver-side apparatus, and the reception buffer receives a signal RXD received from the receiver side apparatus. The signals TXD and RXD are used for transmitting*

control commands between the transmitter side apparatus and the receiver-side apparatus through a low-speed serial communication." column 8, lines 17-26).

Regarding claim 14; Kawamoto '457 discloses a control method for an information processing apparatus, which is connectable to a printing apparatus in which sizes of reception buffer memory allocated for respective color components are changed in accordance with external instruction information, and which outputs print data to said printing apparatus, said method comprising: a generation step of generating image data for respective printing color components based on data to be print-outputted delivered from higher processing (*"Each image forming apparatus includes an image scanner that scans in an original document so as to generate image data,"* column 2, line 8-10); a coding step of compress-encoding the image data for the respective printing color components generated at said generation step (*"an image processing unit for processing the image data, an encoding unit to encode the processed image data..."* column 2, lines 11-12); a notification step of generating memory allocation ratio information based on a ratio of coded data amounts for the respective printing color components coded at said coding step and notifying the information as said instruction information to said printing apparatus (*"the digital image after being filtered by the filter 50-3 is provided to a 4-line FIFO 54-1 of the memory unit 54. The 4-line FIFO stores the digital image data corresponding to 4 lines so as to form a 4.times.4 pixel matrix. Each 4.times.4 pixel matrix is sequentially provided to an encoding unit 54-2 so as to be encoded, and the encoded data is provided to a memory 54-4 such as a DRAM via a selector A 54-3 and is stored in the memory 54-4. The data stored in the memory 54-4 is provided to a hard disc unit 58 by a transfer control unit 57. The image data transferred to the hard disc unit 58 is stored on an individual original document*

basis. Accordingly, the image data stored in the hard disc unit 58 can be read out on an individual original document basis." column 7, lines 21-34); and an output step of outputting the image data for the respective printing color components coded at said coding step to said printing apparatus (*"The digital copy machine 110 can compress the digital image data, and the compressed image data can be transferred to other image forming apparatuses such as the digital copy machine 120 via an image transfer unit 70 while decoding the compressed digital image data so as to output an image based on the decoded digital image data."* column 7, lines 16-21).

Regarding claim 15; Kawamoto '457 discloses a printer driver program for an information processing apparatus, which is connectable to a printing apparatus in which sizes of reception buffer memory allocated for respective color components are changed in accordance with external instruction information, and which outputs print data to said printing apparatus, said program functioning as: generation means for generating image data for respective printing color components based on data to be print-outputted delivered from higher processing (*"Each image forming apparatus includes an image scanner that scans in an original document so as to generate image data,"* column 2, line 8-10); coding means for compress-encoding the image data for the respective printing color components generated by said generation means (*"an image processing unit for processing the image data, an encoding unit to encode the processed image data..."* column 2, line 11-12); notification means for generating memory allocation ratio information based on a ratio of coded data amounts for the respective printing color components coded by said coding means and notifying the information as said instruction information to said printing apparatus (*"the digital image after being filtered by the filter 50-3 is provided to a 4-line*

FIFO 54-1 of the memory unit 54. The 4-line FIFO stores the digital image data corresponding to 4 lines so as to form a 4.times.4 pixel matrix. Each 4.times.4 pixel matrix is sequentially provided to an encoding unit 54-2 so as to be encoded, and the encoded data is provided to a memory 54-4 such as a DRAM via a selector A 54-3 and is stored in the memory 54-4. The data stored in the memory 54-4 is provided to a hard disc unit 58 by a transfer control unit 57. The image data transferred to the hard disc unit 58 is stored on an individual original document basis. Accordingly, the image data stored in the hard disc unit 58 can be read out on an individual original document basis." column 7, lines 21-34); and output means for outputting the image data for the respective printing color components coded by said coding means to said printing apparatus (*"The digital copy machine 110 can compress the digital image data, and the compressed image data can be transferred to other image forming apparatuses such as the digital copy machine 120 via an image transfer unit 70 while decoding the compressed digital image data so as to output an image based on the decoded digital image data."* column 7, lines 16-21).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1, 3 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto '457 in combination with Horiuchi et al. (US 4,413,275 hereinafter, Horiuchi '275).

Regarding claim 1; Kawamoto '457 discloses A printing system including an information processing apparatus which outputs print data and a printing apparatus which receives the print data from said information processing apparatus, wherein said information processing apparatus comprising: generation means for generating image data for respective printing color components based on data to be print-outputted delivered from higher processing (*"Each image forming apparatus includes an image scanner that scans in an original document so as to generate image data,"* column 2, line 8-10); coding means for compress-encoding the image data for the respective printing color components generated by said generation means (*"an image processing unit for processing the image data, an encoding unit to encode the processed image data..."* column 2, line 11-12); notification means for generating memory allocation ratio information based on a ratio of coded data amounts for the respective printing color components coded by said coding means and notifying the information to said printing apparatus (*"the digital image after being filtered by the filter 50-3 is provided to a 4-line FIFO 54-1 of the memory unit 54. The 4-line FIFO stores the digital image data corresponding to 4 lines so as to form a 4.times.4 pixel matrix. Each 4.times.4 pixel matrix is sequentially provided to an encoding unit 54-2 so as to be encoded, and the encoded data is provided to a memory 54-4 such as a DRAM via a selector A 54-3 and is stored in the memory 54-4. The data stored in the memory 54-4 is provided to a hard disc unit 58 by a transfer control unit 57. The image data transferred to the hard disc unit 58 is stored on an individual original document basis. Accordingly, the image data stored in the hard disc unit 58 can be read out on an individual original document basis."* column 7, lines 21-34); and output means for outputting the image data for the respective printing color components coded by said coding means to said printing

apparatus (*"The digital copy machine 110 can compress the digital image data, and the compressed image data can be transferred to other image forming apparatuses such as the digital copy machine 120 via an image transfer unit 70 while decoding the compressed digital image data so as to output an image based on the decoded digital image data."* column 7, lines 16-21); and wherein said printing apparatus comprising: plural decoding means, independently provided for the respective printing color components, for decoding coded data to image data (*"...a decoding unit to decode the encoded image data stored in the memory unit, and a printing unit for printing the decoded image data."* column 2, lines 15-17).

Kawamoto '457 does not expressly disclose a reception buffer to temporarily store the image data for the respective printing color components outputted by said output means; or means for setting sizes of said reception buffer allocated for the respective printing color components, in accordance with the memory allocation ratio information.

Horiuchi '275 discloses a reception buffer to temporarily store the image data for the respective printing color components outputted by said output means (*"The color density signals masked in a CPU are stored or memorized in four line buffer memories and are then fed to a UCR circuit by which color density signals of yellow, magenta, cyan and black are generated. As a result, color density signals are sampled correspondingly to colors of inks to be supplied to each ink-jet head."* column 2, line 68 thru column 3, lines 1-6); means for setting sizes of said reception buffer allocated for the respective printing color components, in accordance with the memory allocation ratio information (*"A color dot matrix pattern is automatically determined depending on the color density, in such a way that the positions and sizes of the ink dots to appear on a single color dot matrix are indicated, while the color density*

signals of each individual color are separated into three series of signals, which are fed to and memorized in buffer memories provided one for every ink-jet head, for controlling the positions and sizes of the ink drops to be ejected from the ink-jet heads. Each series of signals is after the conversion into analog signals for driving an ink-jet head, supplied to each ink-jet head." column 3, lines 7-17).

They are combinable because they are from same field of endeavor of printing systems (*"The present invention relates to an ink-jet color printing apparatus for forming, that is, painting color images with several kinds of colored inks and more particularly to an apparatus which is suitable for painting color images having half tones such as a color photograph."* Horiuchi '275 at column 1, lines 5-9).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printing apparatus as taught by Kawamoto '457 by adding a reception buffer to temporarily store the image data and setting the size of the reception buffer to print color components as taught by Horiuchi '275.

The motivation for doing so would have been to provide an printing apparatus to colored ink-drops from being turbid and flowing (*"The principal object of the present invention is to provide an ink-jet color printing apparatus wherein colored ink drops can be prevented from being turbid and flowing."* Horiuchi '275 at column 2, lines 12-15).

Therefore, it would have been obvious to combine Kawamoto '457 with Horiuchi '275 to obtain the invention as specified in claim 1.

Regarding claim 3; Kawamoto '457 discloses where said generation means includes dither processing means for quantizing one-pixel eight-bit image data for one printing color component into smaller-number-of-bit image data (*"The image processing unit 50 performs various operations such as a black offset correction, a shading correction, an MTF correction, a .gamma.-correction and a dither process or an error diffusion process. The 8-bit digital image data SDT(7:0) processed by the image processing unit 50 is provided to a printer unit 52."* column 6 , lines 11-16).

Regarding claim 7; Kawamoto '457 discloses request means for requesting status information of said reception buffer from said printing apparatus; determination means for determining whether or not next page compressed data for the respective printing color components can be stored in available areas of the reception buffer for the respective printing color components, based on the status information obtained by said request means; and control means for, if said determination means determines that the next page compressed data can be stored, deleting the memory allocation ratio information to be notified by said notification means and causing said output means to output the next page compressed data (*"Additionally, in the present embodiment, a command transfer unit 70-5 comprising a transmission buffer and a reception buffer is provided in the image transfer unit 70. The transmission buffer transmits a signal TXD to the receiver-side apparatus, and the reception buffer receives a signal RXD received from the receiver side apparatus. The signals TXD and RXD are used for transmitting control commands between the transmitter side apparatus and the receiver-side apparatus through a low-speed serial communication."* column 8, lines 17-26).

7. **Claims 2, 4-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto '457 in combination with Horiuchi '275.

Regarding claim 2; Kawamoto '457 does not expressly disclose where respective areas of said reception buffer allocated for the respective printing color components are utilized as a ring buffer.

Horiuchi '275 discloses where respective areas of said reception buffer allocated for the respective printing color components are utilized as a ring buffer (*"Signals of the color image information read out from the memory device are processed by masking by the use of a non-linear polynomial in a CPU, being converted into color density signals of primary colors, namely, yellow, magenta and cyan. The color density signals masked in a CPU are stored or memorized in four line buffer memories and are then fed to a UCR circuit by which color density signals of yellow, magenta, cyan and black are generated."* column 2, lines 64-68 thru column 3, lines 1-4).

They are combinable because they are from same field of endeavor of printing systems (*"The present invention relates to an ink-jet color printing apparatus for forming, that is, painting color images with several kinds of colored inks and more particularly to an apparatus which is suitable for painting color images having half tones such as a color photograph."* Horiuchi '275 at column 1, lines 5-9).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printing apparatus as taught by Kawamoto '457 by adding a reception buffer utilized as a ring buffer for printing color components as taught by Horiuchi '275.

The motivation for doing so would have been to provide an printing apparatus to prevent colored ink-drops from being turbid and flowing (*"The principal object of the present invention is to provide an ink-jet color printing apparatus wherein colored ink drops can be prevented from being turbid and flowing."* Horiuchi '275 at column 2, lines 12-15).

Therefore, it would have been obvious to combine Kawamoto '457 with Horiuchi '275 to obtain the invention as specified in claim 1.

Regarding claim 4; Horiuchi '275 discloses designation means, having plural tables respectively defining a set of dither matrix patterns for a character or line-art area and a halftone image area for the respective printing color components, for designating one of the tables (*"A picture element with half-tone can be formed in about 30 to 70 steps of gradation depending on the variation of sizes and arrangement of ink dots to be distributed in a single dot matrix having three possible positions in both the row and the column."* column 7, lines 25-29).

Regarding claim 5; Horiuchi '275 discloses where said notification means predict-calculates code data amounts for the respective printing color components based on the table designated by said designation means and sizes of halftone image area and character or line-art area for the respective printing color components (*"In the case of printing color images having half-tones and hues such as color photographs, it is necessary to be able to reproduce picture images with half-tones and hues closely similar to the original in at least sixteen steps of gradations. A drop-on-demand type of ink-jet head, whereby ink dots can be varied in size in accordance with voltages applied, is suitably used in general and is well known in this art. In this type of ink-jet head, ink drops are practically limited from 100 to 180.mu. in size so that*

images with half-tones in sufficient steps of gradation are hardly obtainable. To avoid the problem described above, it has been proposed to vary the number of ink dots appearing on a dot matrix having n possible positions in the row and m possible position in the column (n and m being integers) for one picture element so as to reproduce images with half-tones in a sufficiently large number of steps of gradation." column 1, lines 41-57).

Regarding claim 6; Horiuchi '275 discloses where said notification means calculates code data amounts for the respective printing color components by counting data amounts obtained by quantizing the halftone image areas and the character or line-art areas for the respective printing color components in accordance with the table designated by said designation means (*"In the case of printing color images having half-tones and hues such as color photographs, it is necessary to be able to reproduce picture images with half-tones and hues closely similar to the original in at least sixteen steps of gradations. A drop-on-demand type of ink-jet head, whereby ink dots can be varied in size in accordance with voltages applied, is suitably used in general and is well known in this art. In this type of ink-jet head, ink drops are practically limited from 100 to 180.mu. in size so that images with half-tones in sufficient steps of gradation are hardly obtainable. To avoid the problem described above, it has been proposed to vary the number of ink dots appearing on a dot matrix having n possible positions in the row and m possible position in the column (n and m being integers) for one picture element so as to reproduce images with half-tones in a sufficiently large number of steps of gradation."* column 1, lines 41-57).

8. **Claims 10-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto '457 in combination with Horiuchi '275.

Regarding claim 10; Kawamoto '457 does not expressly disclose designation means, having plural tables respectively defining a set of dither matrix patterns for a character or line-art area and a halftone image area for the respective printing color components, for designating one of the tables.

Horiuchi '275 discloses designation means, having plural tables respectively defining a set of dither matrix patterns for a character or line-art area and a halftone image area for the respective printing color components, for designating one of the tables (*"A picture element with half-tone can be formed in about 30 to 70 steps of gradation depending on the variation of sizes and arrangement of ink dots to be distributed in a single dot matrix having three possible positions in both the row and the column."* column 7, lines 25-29).

They are combinable because they are from same field of endeavor of printing systems (*"The present invention relates to an ink-jet color printing apparatus for forming, that is, painting color images with several kinds of colored inks and more particularly to an apparatus which is suitable for painting color images having half tones such as a color photograph."* Horiuchi '275 at column 1, lines 5-9).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printing apparatus as taught by Kawamoto '457 by adding designation means for designating one of the tables as taught by Horiuchi '275.

The motivation for doing so would have been to provide an printing apparatus to prevent colored ink-drops from being turbid and flowing (*"The principal object of the present invention*

is to provide an ink-jet color printing apparatus wherein colored ink drops can be prevented from being turbid and flowing." Horiuchi '275 at column 2, lines 12-15).

Therefore, it would have been obvious to combine Kawamoto '457 with Horiuchi '275 to obtain the invention as specified in claim 8.

Regarding claim 11; Horiuchi '275 discloses where said notification means predict-calculates code data amounts for the respective printing color components based on the table designated by said designation means and sizes of halftone image area and character or line-art area for the respective printing color components (*"In the case of printing color images having half-tones and hues such as color photographs, it is necessary to be able to reproduce picture images with half-tones and hues closely similar to the original in at least sixteen steps of gradations. A drop-on-demand type of ink-jet head, whereby ink dots can be varied in size in accordance with voltages applied, is suitably used in general and is well known in this art. In this type of ink-jet head, ink drops are practically limited from 100 to 180.mu. in size so that images with half-tones in sufficient steps of gradation are hardly obtainable. To avoid the problem described above, it has been proposed to vary the number of ink dots appearing on a dot matrix having n possible positions in the row and m possible position in the column (n and m being integers) for one picture element so as to reproduce images with half-tones in a sufficiently large number of steps of gradation."* column 1, lines 41-57).

Regarding claim 12; Horiuchi '275 discloses where said notification means calculates code data amounts for the respective printing color components by counting data amounts obtained by quantizing the halftone image areas and the character or line-art areas for the

respective printing color components in accordance with the table designated by said designation means (*"In the case of printing color images having half-tones and hues such as color photographs, it is necessary to be able to reproduce picture images with half-tones and hues closely similar to the original in at least sixteen steps of gradations. A drop-on-demand type of ink-jet head, whereby ink dots can be varied in size in accordance with voltages applied, is suitably used in general and is well known in this art. In this type of ink-jet head, ink drops are practically limited from 100 to 180.mu. in size so that images with half-tones in sufficient steps of gradation are hardly obtainable. To avoid the problem described above, it has been proposed to vary the number of ink dots appearing on a dot matrix having n possible positions in the row and m possible position in the column (n and m being integers) for one picture element so as to reproduce images with half-tones in a sufficiently large number of steps of gradation."* column 1, lines 41-57).

9. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto '457 in combination with Horiuchi '275.

Regarding claim 16; Kawamoto '457 does not expressly discloses a computer-readable storage medium holding the printer driver program.

Horiuchi '275 discloses a computer-readable storage medium holding the printer driver program (*"A conventional mini-computer can be employed as the CPU described above for controlling the color image information input unit 1 and printer 3, for controlling the memorizing or reading out of the color image information, and for carrying out the various image processings."* column 5, lines 30-35).

They are combinable because they are from same field of endeavor of printing systems (*"The present invention relates to an ink-jet color printing apparatus for forming, that is, painting color images with several kinds of colored inks and more particularly to an apparatus which is suitable for painting color images having half tones such as a color photograph."* Horiuchi '275 at column 1, lines 5-9).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printing apparatus as taught by Kawamoto '457 by adding computer-readable medium for storing the printer driver program as taught by Horiuchi '275.

The motivation for doing so would have been to provide a printing apparatus which is simple in structure and which does not need a large scale time delaying circuit. (*"A further object of the present invention is to provide an ink-jet color printing apparatus which is simple in structure and which does not need a large scale time delaying circuit."* Horiuchi '275 at column 2, lines 16-19).

Therefore, it would have been obvious to combine Kawamoto '457 with Horiuchi '275 to obtain the invention as specified in claim 14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcus T. Riley whose telephone number is 571-270-1581. The examiner can normally be reached on Monday - Friday, 7:30-5:00, est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on 571-272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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